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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/015,863      | 12/12/2001  | Willibrord A. Groten | CDT 1756-2          | 2592             |

1338 7590 10/18/2004

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| EXAMINER |
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GRIFFIN, WALTER DEAN

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| ART UNIT | PAPER NUMBER |
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1764

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/015,863

Applicant(s)

WILLIBRORD A. GROTEN

Examiner

Walter D. Griffin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Response to Appeal Brief***

In view of the appeal brief filed on June 7, 2004, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fletcher et al. (US 5,290,427).

The Fletcher reference discloses a process for removing sulfur from a naphtha feedstock. The process comprises fractionating the naphtha to form two or more fractions of increasing boiling range. These two or more fractions are then hydrotreated to remove sulfur compounds. The hydrotreatment steps comprises passing the heavier fraction to a reactor where the fraction contacts a catalyst at hydrodesulfurization conditions to convert sulfur compounds present in the fraction to hydrogen sulfide. The lighter fraction is then passed to the reactor where it is mixed with the hydrodesulfurized heavier fraction. This mixture is then passed to a second catalyst bed where it is subjected to hydrodesulfurization conditions. The reference also discloses that a light fraction that boils below about 150°F (65°C) contains mostly mercaptans as the sulfur compounds present and that these mercaptans may be removed by an extractive type process. Therefore, the Fletcher reference discloses separating the naphtha into three fractions with the lightest fraction that contains mostly mercaptans being subjected to a caustic wash, the heaviest fraction being subjected to hydrodesulfurization and then mixed with what is equivalent to the intermediate fraction with this mixture being subjected to further hydrodesulfurization. The heavier fractions contain thiophenes and heavier sulfur compounds. The process is operated so that desulfurization should be at least 75% as compared to the sulfur content of the feed. See column 3, lines 12-55; column 4, lines 5-60; column 6, lines 1-11; column 8, lines 64-68; column

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9, lines 1-20 and 52-59; column 10, lines 65-68; column 11, lines 1-22; and column 12, lines 42-45.

The Fletcher reference does not disclose the use of two separate hydrodesulfurization reactors. It also does not disclose the sulfur compounds present in the intermediate and heavy fractions and does not disclose the boiling ranges for the fractions.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Fletcher by utilizing two separate reactors for the hydrodesulfurization steps because such an arrangement is equivalent to two separate catalyst beds in one reactor vessel.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Fletcher by utilizing the claimed fractions with the claimed boiling ranges because any boiling range fractions will be effectively treated as long as the heavier fraction is introduced at the inlet of the reactor. By providing the claimed fractions, the types of sulfur compounds present in each fraction would necessarily be the same as claimed.

Claims 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fletcher et al. (US 5,290,427) in view of Hearn et al. (US 5,597,476).

As discussed above, the Fletcher reference does not disclose a thioetherification step.

The Hearn reference discloses the reaction of mercaptans with diolefins in a hydrocarbon stream prior to a hydrodesulfurization step. See column 2, lines 30-62.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Fletcher by including a thioetherification

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step prior to the hydrodesulfurization step as suggested by Hearn because much of the sulfur will be removed from the lighter fractions and will be converted to hydrogen sulfide during the hydrodesulfurization step. By doing this, substantial losses of olefins are eliminated.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art not relied upon discloses desulfurization processes.

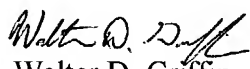
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is (571) 272-1447.

The examiner can normally be reached on Monday-Friday 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Walter D. Griffin  
Primary Examiner  
Art Unit 1764

WG

October 12, 2004

  
Glenn Caldarola  
Supervisory Patent Examiner  
Technology Center 1700